

Message Text

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TO AMEMBASSY TOKYO PRIORITY

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E.O. 11652: N/A

TAGS: ENRG

SUBJECT: FUKUDA INITIATIVE

FOLLOWING TEXT ON POSSIBLE US/JAPAN ENERGY COOPERATION
RESPONDING TO FUKUDA INITIATIVE PROVIDED TO JAPANESE
E,BASSY, WASHINGTON ON AUGUST 3:

I. HIGHEST PRIORITY

SRC-II

SRC-II IS A 6000 TONS PER DAY COAL LIQUEFACTION DEMONSTRATION PLANT ESTIMATED TO COST \$600-700 MILLION, WITH FUNDING COMING FROM THE U.S. GOVERNMENT, U.S. INDUSTRY, AND FROM POSSIBLE FOREIGN PARTICIPATION. DOE IS DISCUSSING WITH FRG THE POSSIBILITY OF THEIR SUPPORTING 25 OF THE
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TOTAL PROJECT COST. DETAILED DESIGN OF THE PLANT IS EXPECTED TO TAKE PLACE IN FISCAL YEAR 1979-1980, CONSTRUCTION IN 1979-1982 AND OPERATION IN FY 1982-84.

JAPANESE PARTICIPATION IN THIS PROJECT IS OF THE HIGHEST PRIORITY TO DOE.

II. SECOND PRIORITY

FUSION. PROJECTS IN DESCENDING ORDER OF PRIORITY.

A. DOUBLET III IMPROVEMENT PROGRAM

JAPANESE FUNDING OF THE IMPROVEMENT OF DOUBLET III (FOR POWER SUPPLIES FOR NEUTRAL BEAMS AND UPGRADED TOROIDAL FIELD COILS) AT AN APPROXIMATE COST OF \$50 MILLION WOULD ALLOW THIS DEVICE TO PRODUCE H₂ DROGEN, D-SHAPED PLASMAS AT CLOSE TO REACTOR CONDITIONS WELL BEFORE ANY OTHER MACHINE IN THE WORLD.

JAPANESE COULD PARTICIPATE IN THE DESIGN OF THE UPGRADING PACKAGE AND HAVE DEDICATED TIME FOR A RESEARCH TEAM FOR EXPERIMENTS WHILE PROVIDING U.S. RESEARCHERS WITH A SIGNIFICANTLY UPGRADED CAPABILITY.

A JAPANESE INVESTMENT OF ABOUT \$7 MILLION IN THE FY 1980 BUDGET WOULD BE OF INTEREST.

B. TFTR

THE TFTR IS ONE OF THE THREE LARGE TOKAMAKS NOW UNDER CONSTRUCTION (THE OTHER TWO ARE EURATOM'S JET AND JAPAN'S JT-60) AND WILL BE THE FIRST TO USE A D-T CIRCULAR PLASMA.
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THE JAPANESE WOULD BE WELCOME TO WORK WITH THE TFTR TEAM AND TO MAKE A FINANCIAL CONTRIBUTION TO THE CONTINUED PROGRESS OF TFTR..

C. MATERIALS RESEARCH

ONE OF THE MOST SIGNIFICANT ENGINEERING DEVELOPMENT PROBLEM WHICH MUST BE SOLVED FOR BOTH MAGNETIC AND INERTIAL FUSION POWER APPLICATIONS IS THE DEVELOPMENT AND QUALIFICATION OF MATERIALS FOR REACTORS. COORDINATED PLANNING AND INTEGRATION OF MATERIALS TESTING PROGRAMS USING EXISTING FACILITIES IN EACH COUNTRY WOULD BE AN ESSENTIAL ELEMENT OF THE PROGRAM.

III. THIRD PRIORITY

PROJECTS SUGGESTED BY JAPANESE "NON-PAPER", IN DESCENDING ORDER OF PRIORITY.

A. SOLAR ENERGY

PHOTOSYNTHESIS RESEARCH INCLUDES THE AREAS OF PHOTOSYNTHESIS

TIC SOLAR ENERGY CONVERSION, BIOLOGICAL HYDROGEN PRODUCTION
PHOTOPHYSICAL AND PHOTOCHEMICAL SOLAR ENERGY CONVERSION
AND PHOTOCHEMICAL PRODUCTION OF HYDROGEN AND HIGH ENERGY
COMPOUNDS. IN TOTAL OVER \$20 MILLION PER YEAR (DOE \$6
MILLION, NSF \$8 MILLION, AND USDA \$8 MILLION) IS SPENT
ON PHOTOSYNTHESIS AND BASIC PHOTOCHEMISTRY, MUCH OF IT
THROUGH A LARGE NUMBER OF INDIVIDUAL INVESTIGATORS IN
UNIVERSITY AND GOVERNMENT LABORATORIES THROUGHOUT THE
COUNTRY. A SERIES OF ANNUAL MEETINGS AND EXCHANGES
BETWEEN U.S. AND JAPANESE SCIENTISTS IN PHOTOSYNTHESIS WORK
COULD BE ESTABLISHED TO ENHANCE THE INFORMATION EXCHANGE
PROCESS AND ULTIMATELY LEAD TO GREATER COORDINATION AND
FOCUS ON PRIORITY AREAS OF RESEARCH. SERI COULD BECOME
AN INTERNATIONAL INSTITUTE TO COORDINATE THE PLANNING AND
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IMPLEMENTATION OF BASIC PHOTOSYNTHESIS RESEARCH. U.S.-
JAPANESE EFFORTS COULD BE JOINTLY FUNDED AND ARE ESTI-
MATED TO COST IN THE RANGE OF \$3 TO 5 MILLION.

B. GEOTHERMAL ENERGY

1. HOT DRY ROCK (HDR)

A SMALL THERMAL LOOP IS PRESENTLY BEING UPGRADED TO 10 MWT
AT LASL TO TEST FURTHER THE HDR CONCEPT. A 50 MWT FLOW
LOOP IS SCHEDULED FOR CONSTRUCTION DURING 1979-80 AT A
COST OF ABOUT \$12 MILLION. THE JAPANESE COULD PARTICIPATE
IN CONSTRUCTION OF THE LOOP AND ITS SUBSEQUENT OPERATION
AND THEREBY INCREASE THE CAPABILITY OF THE PROJECT.

2. BINARY-CYCLE POWER PLANT

DOE IS ABOUT TO BEGIN CONSTRUCTION OF A 5 MWE BINARY-CYCLE
TEST PLANT AT RAFT RIVER, IDAHO AT A COST OF \$28 MILLION
(INCLUDING COSTS FOR WELLS) USING STATE-OF-THE-ART
COMPONENTS. A FOLLOW-ON, 5 MWE BINARY TEST PLANT USING
ADVANCED COMPONENTS TO DEMONSTRATE ECONOMICS IS PLANNED

FOR 1980 AT APPROXIMATELY THE SAME COSTS. JAPANESE PARTI-
CIPATION IN THE TWO PROJECTS AT RAFT RIVER WOULD ASSURE ITS
TIMELY COMPLETION AND CONTRIBUTE TO IMPROVEMENTS IN THE
DESIGN OF THE FOLLOW-ON PLANT.

C. INERTIAL CONFINEMENT FUSION (ICF)

1. LASER USER'S FACILITY AT THE UNIVERSITY OF ROCHESTER

THE LASER FUSION EFFORT AT THE UNIVERSITY OF ROCHESTER IS
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COMPLETELY UNCLASSIFIED, AND HAS PARTIAL OPERATING COST SUPPORT FROM INDUSTRIAL SPONSORS. THE JAPANESE MAY BE INTERESTED IN SUPPORTING AN EXPANDED PROGRAM OF RESEARCH, IN ENHANCING FACILITIES, OR IN PARTICIPATING DIRECTLY IN THE RESEARCH PROGRAM WITH EXISTING SPONSORS (TOTAL PROGRAM COST IS \$8 MILLION PER YEAR). (ALSO, IN A SIMILAR MANNER, THE JAPANESE MAY BE INTERESTED IN SHARING THE COST, PARTICIPATING IN, AND EXPANDING THE KMSF BROAD EFFORT AIMED AT THE DEVELOPMENT AND ENGINEERING OF FUSION DEVICES. CURRENT DOE SUPPORT IS \$7 MILLION PER YEAR.)

2. HEAVY ION DEMONSTRATION EXPERIMENT

HEAVY ION FUSION IS A NEW AND PROMISING APPROACH TO ICF. PARTICLE ACCELERATORS ARE AT A HIGH STATE OF DEVELOPMENT COMPARED TO OTHER ICF DRIVERS. THE JAPANESE COULD PARTICIPATE IN THE STUDY OF CERTAIN ASPECTS OF THIS APPROACH TO INERTIAL CONFINEMENT FUSION, SUCH AS ACCELERATOR DESIGN.

3. ADVANCED LASER DEVELOPMENT

ULTIMATE SUCCESS OF LASER ICF MAY DEPEND ON DEVELOPMENT OF ADVANCED LASER SYSTEMS. CURRENT PROGRESS IS BUDGET-LIMITED AT ABOUT \$9 MILLION PER YEAR. COORDINATION OF WORK WITH JAPAN AND SOME FUNDING SUPPORT, ALONG WITH PARTICIPATION IN THE U.S. R&D PROGRAM, WOULD ACCELERATE THE EFFORT.

D. PLASMA PHYSICS INSTITUTE

AN INSTITUTE OF PLASMA PHYSICS, JOINTLY SUPPORTED BY THE U.S. AND JAPAN, WOULD BE A USEFUL APPROACH TO FOCUS ON THE THEORETICAL AND ANALYTICAL ASPECTS OF BOTH MFE AND ICF SYSTEMS AND FUEL CYCLES, AND FACILITATE TRAINING OF SCIENTISTS FOR THIS TECHNOLOGY. THE COST WOULD BE IN THE RANGE OF \$3 TO \$5 MILLION PER YEAR.

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IV. LOWEST PRIORITY

A. HIGH ENERGY PHYSICS

A JOINT JAPANESE-AMERICAN HIGH ENERGY PHYSICS "INSTITUTE" COULD BE ESTABLISHED IN THE UNITED STATES AS AN UMBRELLA

ORGANIZATION DEDICATED TO SUPPORTING INITIATIVES IN HIGH ENERGY PHYSICS INVOLVING JAPANESE PHYSICISTS. SUCH INITIATIVES MIGHT INCLUDE COLLABORATIVE THEORETICAL STUDIES EXPERIMENTAL STUDIES, AND DEVELOPMENT AND FABRICATION OF MAJOR DETECTION FACILITIES FOR USE WITH NEW U.S. ACCELERATOR AND COLLIDING BEAM CAPABILITIES. NEWSOM

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